

A METHOD OF MOUNTING, PRESERVING AND EXAMINING MICRO-ARTHROPODA.

BY J. ARTHUR REYNIERS, Department of Biology,
University of Notre Dame, Indiana.

Every biologist wants a method for permanently mounting and preserving minute specimens of Acarina, Crustacea and Insecta so that they can be stored in the museum and still be immediately available for microscopic examination. If this method is at the same time simple, convenient, and inexpensive, then the desideratum seems to have been attained. The writer believes that the method presented in this paper meets all these requirements.

The method consists in mounting micro animals or plants, suspended in a preservative fluid, in flattened or square capillaries, and of so attaching these capillaries in a lathe arrangement on a slide that they can be turned in any direction under the lens of the microscope.

The capillaries are made so that they are square and with very thin walls. This requires making the flattened glass tubing from which the capillaries are drawn. For this purpose round glass tubing is flattened, after being heated, between two heated steel blocks, or, in a more simple manner, by bending the tubing around the base of a Bunsen burner. It is well to bear in mind that the thinner the walls of the glass tubing used, the better the capillary tube will be both for vision and for handling. If it is desired to make a preparation that will give especially satisfying results, the better grade of glass tubing, such as may be secured from dealers in microscopic supplies and listed as extra grade, should be secured. The tubing that was used in the preparations that form the basis of this paper had an outside diameter of $\frac{3}{8}$ " , with a lumen of $\frac{1}{4}$ " .

A piece of tubing about four inches long is held in the flame of a wing top Bunsen burner and rotated between the fingers until it becomes soft. It is then quickly bent around the tube of the burner until it has assumed a U shape. It is again heated in the flame—this time the bottom of the U is held upward in the flame. When the tubing is soft it is bent in the opposite direction around the base of the burner and, holding it again in the flame, it is straightened. This procedure gives a piece of tubing that is flattened on both sides.

The flattened portion of the tubing is held in the wing top, in a low flame, and rotated between the fingers. When it is softened the tube is removed from the flame and the hands quickly drawn apart. This procedure gives a capillary of the desired size. The junction of the flattened capillary with the round glass tubing is flared to a funnel shape. A point is selected on the funnel which will more than admit the insect to be mounted and is nicked with a file. The flattened portion of the capillary tapers toward the center and should be at this point just a bit smaller than the insect to be mounted. The capillary is again nicked with a file and is broken off so that two portions exist: both with a flared end and a flattened stem.

The insect may be mounted either in a preservative fluid or some other fluid depending on the length of time it is to be kept. In either case it is suspended in a comparatively large volume. The funnel shaped end of one of the capillaries is brought next to the insect and a quantity of fluid is allowed to run up into the tube either by suction or capillary attraction. The insect is drawn into the capillary with the fluid and if it happens to be broader than it is thick (as is the case with certain Acharina) it will turn so that it fits into the flattened capillary in such a position that it cannot be readily displaced when the capillary is turned. The insect is allowed to go as far back into the capillary as its walls will permit. A two inch length of the tubing is cut, a bit of the fluid is blown out each end of the small piece leaving the ends free of fluid and leaving the specimen suspended in a column of it. The ends of the capillary are sealed in a bunsen flame so that the ball of molten glass which forms on the end are in line with the shaft of the tube. The specimen is now ready for either examination or storage.

For microscopic study of the capillary, a small lathe like arrangement, shown as Fig. 1 in the diagram, is made of brass and glued to an ordinary glass microscope slide. This lathe consists of two end pieces, one the head and the other the tail stock. A hole is bored through the center of the tail stock and is threaded 60 threads to the inch. The screw made to fit this hole has a knurled head at one end and a seating arrangement at the other. This seating arrangement consists of a tapered hole. The head end of the lathe is made of a piece of brass and bears a clutch device to grasp the flattened capillary. This grasping device is fixed to the end of a spindle which turns in the head piece. Detail of

both the head piece and the tail stock is shown in Fig. 1 of the diagram.

In use the apparatus is placed on the stage of a microscope and is held in place by the stage clips. A capillary in which an insect has been mounted is placed in the head end of the apparatus and the grasping jaws closed tightly against it. The tail stock is now screwed up and the free end of the capillary is allowed to center itself in a tapered hole at its end. The round head which is formed by fusion of the glass when the capillary is sealed should act like a bearing when turned. In focussing the microscope, the Abbé condenser is either discarded or the top lens removed so as to give a longer light range. If the specimen is not in a position to be examined favorably the capillary is turned by manipulating the knurled head. If it is desired to examine the insect more closely the ends of the capillary may be broken and the insect expelled into a volume of fluid and after being examined may be resealed in a fresh capillary. Specimens may be mounted for museum purposes on glass plates by fixing the ends of the capillaries with traces of balsam. A whole family of insects of microscopic character may be neatly mounted in this manner. It goes without saying that the capillaries may be made of any size and the lathe arrangement made larger or smaller as the case requires.

KEY TO PLATE XIV.

Fig. 1.—Construction of the lathe mechanism and detail of the tail stock and head.

- a End piece of brass through which the head turns.
- b End piece of brass through which a threaded tail stock is screwed.
- c Glass microscope slide upon which the lathe is mounted.
- d Capillary containing an insect, in place on the lathe.

Fig. 2.—Showing method of drawing and sealing the capillaries.

- A Capillary drawn to size and cut so that a cone shaped end is made on each capillary.
- B Method of sealing the capillary in a flame so that the rounded ends may act as bearings.

Fig. 3.—Showing method of mounting capillaries on slide for museum or storage purposes.